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Relevance scale **1 Modeling motion blur in computer-generated images**

Michael Potmesil, Indranil Chakravarty

July 1983 **ACM SIGGRAPH Computer Graphics , Proceedings of the 10th annual conference on Computer graphics and interactive techniques**, Volume 17 Issue 3Full text available:  [pdf\(1.03 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes a procedure for modeling motion blur in computer-generated images. Motion blur in photography or cinematography is caused by the motion of objects during the finite exposure time the camera shutter remains open to record the image on film. In computer graphics, the simulation of motion blur is useful both in animated sequences where the blurring tends to remove temporal aliasing effects and in static images where it portrays the illusion of speed or movement among the o ...

**Keywords:** Camera model, Digital optics, Image restoration, Motion blur, Point-spread function

**2 Image-based motion blur for stop motion animation**

Gabriel J. Brostow, Irfan Essa

August 2001 **Proceedings of the 28th annual conference on Computer graphics and interactive techniques**Full text available:  [pdf\(807.21 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Stop motion animation is a well-established technique where still pictures of static scenes are taken and then played at film speeds to show motion. A major limitation of this method appears when fast motions are desired; most motion appears to have sharp edges and there is no visible motion blur. Appearance of motion blur is a strong perceptual cue, which is automatically present in live-action films, and synthetically generated in animated sequences. In this paper, we present an approach fo ...

**Keywords:** animation, computer vision, image-based rendering, motion blur, stop motion animation, temporal antialiasing, video post-processing

**3 A two-and-a-half-D motion-blur algorithm**

Nelson L. Max, Douglas M. Lerner

July 1985 **ACM SIGGRAPH Computer Graphics , Proceedings of the 12th annual**

**conference on Computer graphics and interactive techniques, Volume 19 Issue 3**Full text available:  pdf(4.15 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Algorithms are presented for raster and vector motion blur, which produce images and masks suitable for combination by the 21/2-D compositing process. The raster algorithm is based on a "skew, blur, unskew" scheme, using a very efficient one-dimensional blurring algorithm. The vector algorithm extends the ideas of anti-aliased scan conversion to motion blur.

**Keywords:** compositing, computer animation, mask, motion blur, raster, skew, vector

**4 Ray tracing: graphics for the masses**

Paul Rademacher

May 1997 **Crossroads**, Volume 3 Issue 4Full text available:  html(40.75 KB) Additional Information: [full citation](#), [index terms](#)**5 With J: Fast Fourier transforms and removing motion blur**

Cliff Reiter

September 2000 **ACM SIGAPL APL Quote Quad**, Volume 31 Issue 1Full text available:  pdf(335.65 KB) Additional Information: [full citation](#), [references](#), [index terms](#)**6 Colour, rendering and tone-mapping: Time dependent photon mapping**

Mike Cammarano, Henrik Wann Jensen

July 2002 **Proceedings of the 13th Eurographics workshop on Rendering**Full text available:  pdf(1.26 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

The photon map technique for global illumination does not specifically address animated scenes. In particular, prior work has not considered the problem of temporal sampling (motion blur) while using the photon map. In this paper we examine several approaches for simulating motion blur with the photon map. In particular we show that a distribution of photons in time combined with the standard photon map radiance estimate is incorrect, and we introduce a simple generalization that correctly handle ...

**7 Animation: from cartoons to the user interface**

Bay-Wei Chang, David Ungar

December 1993 **Proceedings of the 6th annual ACM symposium on User interface software and technology**Full text available:  pdf(1.35 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** Self, animation, cartoons, motion blur, user interfaces

**8 Rendering: An efficient spatio-temporal architecture for animation rendering**

Vlastimil Havran, Cyrille Damez, Karol Myszkowski, Hans-Peter Seidel

June 2003 **Proceedings of the 14th Eurographics workshop on Rendering**Full text available:  pdf(2.84 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Producing high quality animations featuring rich object appearance and compelling lighting

effects is very time consuming using traditional frame-by-frame rendering systems. In this paper we present a rendering architecture for computing multiple frames at once by exploiting the coherence between image samples in the temporal domain. For each sample representing a given point in the scene we update its view-dependent components for each frame and add its contribution to pixels identified through ...

## 9 Distributed ray tracing

Robert L. Cook, Thomas Porter, Loren Carpenter

January 1984 **ACM SIGGRAPH Computer Graphics , Proceedings of the 11th annual conference on Computer graphics and interactive techniques**, Volume 18 Issue 3

Full text available: [pdf\(909.54 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Ray tracing is one of the most elegant techniques in computer graphics. Many phenomena that are difficult or impossible with other techniques are simple with ray tracing, including shadows, reflections, and refracted light. Ray directions, however, have been determined precisely, and this has limited the capabilities of ray tracing. By distributing the directions of the rays according to the analytic function they sample, ray tracing can incorporate fuzzy phenomena. This provides c ...

**Keywords:** Camera, Constructive solid geometry, Depth of field, Focus, Gloss, Motion blur, Penumbras, Ray tracing, Shadows, Translucency, Transparency

## 10 Session P15: multidimensional, motion, and information visualization: Kinetic visualization: a technique for illustrating 3D shape and structure

Eric B. Lum, Aleksander Stompeł, Kwan Liu Ma

October 2002 **Proceedings of the conference on Visualization '02**

Full text available: [pdf\(3.48 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Motion provides strong visual cues for the perception of shape and depth, as demonstrated by cognitive scientists and visual artists. This paper presents a novel visualization technique --- *kinetic visualization* --- that uses particle systems to add supplemental motion cues which can aid in the perception of shape and spatial relationships of static objects. Based on a set of rules following perceptual and physical principles, particles flowing over the surface of an object not only bring ...

**Keywords:** animation, particle systems, scientific visualization, visual perception, volume rendering

## 11 Alternate rendering pipeline: Cartoon dioramas in motion

Ramesh Raskar, Remo Ziegler, Thomas Willwacher

June 2002 **Proceedings of the 2nd international symposium on Non-photorealistic animation and rendering**

Full text available: [pdf\(739.52 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Cartoon animations delight the audience with moving characters but they remain on a flat 2D screen. The cartoon dioramas, on the other hand, are detailed, three-dimensional and allow physical interaction but they are static. We present techniques to combine the two in some limited cases. We illuminate static physical models with projectors. The images are generated with real time three dimensional computer graphics. We describe a system to demonstrate various visual effects such as non-photoreal ...

**Keywords:** augmented reality, immersive environments, non-photorealistic rendering, perception, virtual reality

**12** [Video Processing: Motion-based segmentation and contour-based classification of video objects](#)



Gerald Kühne, Stephan Richter, Markus Beier

October 2001 **Proceedings of the ninth ACM international conference on Multimedia**

Full text available:  [pdf\(1.74 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The segmentation of objects in video sequences constitutes a prerequisite for numerous applications ranging from computer vision tasks to second-generation video coding. We propose an approach for segmenting video objects based on motion cues. To estimate motion we employ the 3D structure tensor, an operator that provides reliable results by integrating information from a number of consecutive video frames. We present a new hierarchical algorithm, embedding the structure tensor into a multiresolu ...

**Keywords:** curvature scale, motion segmentation, object classification, space, structure tensor

**13** [The accumulation buffer: hardware support for high-quality rendering](#)



Paul Haeblerli, Kurt Akeley

September 1990 **ACM SIGGRAPH Computer Graphics , Proceedings of the 17th annual conference on Computer graphics and interactive techniques**, Volume 24 Issue 4

Full text available:  [pdf\(3.46 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper describes a system architecture that supports realtime generation of complex images, efficient generation of extremely high-quality images, and a smooth trade-off between the two. Based on the paradigm of integration, the architecture extends a state-of-the-art rendering system with an additional high-precision image buffer. This additional buffer, called the Accumulation Buffer, is used to integrate images that are rendered into the framebuffer. While originally conceived as a solutio ...

**14** [Antialiasing of interlaced video animation](#)



John Amanatides, Don P. Mitchell

September 1990 **ACM SIGGRAPH Computer Graphics , Proceedings of the 17th annual conference on Computer graphics and interactive techniques**, Volume 24 Issue 4

Full text available:  [pdf\(7.19 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The production of computer-generated video presents a number of difficulties not encountered with motion pictures. Interlaced scanning and the color subcarrier of NTSC video are responsible for special problems such as interline flicker, and chroma aliasing. As in motion pictures, temporal aliasing is also an issue. A renderer can sample and filter a moving image in an arbitrary manner and is not constrained to simply imitate the behavior of a television camera. This paper explores several diffe ...

**15** [Providing a low latency user experience in a high latency application](#)



Brook Conner, Loring Holden

April 1997 **Proceedings of the 1997 symposium on Interactive 3D graphics**

Full text available:  [pdf\(502.61 KB\)](#)

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**16 A multiple track animator system for motion synchronization (abstract only)**

D. Fortin, J. F. Lamy, D. Thalmann

January 1984 **ACM SIGGRAPH Computer Graphics**, Volume 18 Issue 1Full text available:  pdf(3.92 MB) Additional Information: [full citation](#), [abstract](#)

MUTAN (MULTiple Track ANimator) is an interactive system for independently animating three-dimensional graphical objects. MUTAN can synchronize different motions; it is also a good tool for synchronizing motion with sound, music, light or smell. To indicate moments in time, marks are associated with appropriate frame numbers. MUTAN enables the marks to be manipulated. An animator can also adjust one motion without modifying the others. To make this possible, MUTAN handles several tracks at a time ...

**17 Motion analysis of grammatical processes in a visual-gestural language (abstract only)**

Howard Poizner, Edward S. Klima, Ursula Bellugi, Robert B. Livingston

January 1984 **ACM SIGGRAPH Computer Graphics**, Volume 18 Issue 1Full text available:  pdf(3.92 MB) Additional Information: [full citation](#), [abstract](#)

Movement of the hands and arms through space is an essential element both in the lexical structure of American Sign Language (ASL), and, most strikingly, in the grammatical structure of ASL: it is in patterned changes of the movement of signs that many grammatical attributes are represented. These grammatical attributes occur as an isolable superimposed layer of structure, as demonstrated by the accurate identification by deaf signers of these attributes presented only as dynamic point-light dis ...

**18 Selective attention to aspects of motion configurations: common vs. relative motion (abstract only)**

James R. Pomerantz, Nelson Toth

January 1984 **ACM SIGGRAPH Computer Graphics**, Volume 18 Issue 1Full text available:  pdf(3.92 MB) Additional Information: [full citation](#), [abstract](#)

The motion of a dot configuration may be described as the sum of its relative (part) and common (whole) motion components. Is either of these two component dimensions extracted before the other in human perception? Reaction time data from selective attention experiments show that neither dimension can be responded to without interference from the other, implying that neither is processed more quickly than or ahead of the other. Following Garner's nomenclature, common and relative motions appear ...

**19 The cross-ratio and the perception of motion and structure (abstract only)**

William A. Simpson

January 1984 **ACM SIGGRAPH Computer Graphics**, Volume 18 Issue 1Full text available:  pdf(3.92 MB) Additional Information: [full citation](#), [abstract](#)

Followers of J. J. Gibson have proposed that the cross-ratio, a projective invariant for four collinear points, underlies the perception of objects in motion. Experiment 1 tested this theory by presenting subjects with displays of 3 or 4 dots rotating in depth. Accuracy was equally high in both conditions for motion and structure judgements, so the cross-ratio cannot be necessary. Experiments 2 and 3 tested the cue of lining up, and some evidence for its use was found. The results are consistent ...

**20 A hybrid approach to structure-from-motion (abstract only)**

Aaron Bobick

January 1984 **ACM SIGGRAPH Computer Graphics**, Volume 18 Issue 1Full text available:  pdf(3.92 MB) Additional Information: [full citation](#), [abstract](#)

A method is presented for computing structure from the motion of rigid objects which are rotating about a fixed axis. The input consists of two discrete frames containing the

positions and instantaneous direction vectors of three points in orthographic projection. Because only the direction of the velocity vectors and not their magnitudes is needed, the method is insensitive to errors in velocity magnitude estimation. This type of computation could be important in recovering the 3-dimensional st ...

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### ↑ ABSTRACT

This paper describes a procedure for modeling motion blur in computer-generated images. Motion blur in photography or cinematography is caused by the motion of objects during the finite exposure time the camera shutter remains open to record the image on film. In computer graphics, the simulation of motion blur is useful both in animated sequences where the blurring tends to remove temporal aliasing effects and in static images where it portrays the illusion of speed or movement among the objects in the scene. The camera model developed for simulating motion blur is described in terms of a generalized image-formation equation. This equation describes the relationship between the object and corresponding image points in terms of the optical system-transfer function. The use of the optical system-transfer function simplifies the description of time-dependent variations of object motion that may occur during the exposure time of a camera. This approach allows us to characterize the motion of objects by a set of system-transfer functions which are derived from the path and velocity of objects in the scene and the exposure time of a camera.

### ↑ REFERENCES

Note: OCR errors may be found in this Reference List extracted from the full text article. ACM has opted to expose the complete List rather than only correct and linked references.

- 1 [Harry C. Andrews , B. R. Hunt, Digital Image Restoration, Prentice Hall Professional Technical Reference, 1977](#)

2 Blinn, J., F., "Systems Aspects of Computer Image Synthesis and Animation", SIGGRAPH 1982 Tutorial Notes

3 Dainty, J. C., and Shaw, R., Image Science, Academic Press, New York, 1974

4 Goodman, J. W., Introduction to Fourier Optics, McGraw-Hill, Inc., New York, 1968, Chapter 4,5

5 Newell, M. E., Newell, R. G., and Sancha, T. L., "A New Approach to the Shaded Picture Problem", Proceedings of the ACM National Conference, 1972

6 Michael Potmesil , Indranil Chakravarty, A lens and aperture camera model for synthetic image generation, Proceedings of the 8th annual conference on Computer graphics and interactive techniques, p.297-305, August 03-07, 1981, Dallas, Texas, United States

7 Michael Potmesil , Indranil Chakravarty, Synthetic Image Generation with a Lens and Aperture Camera Model, ACM Transactions on Graphics (TOG), v.1 n.2, p.85-108, April 1982

8 William K. Pratt, Digital image processing, John Wiley & Sons, Inc., New York, NY, 1978

9 Craig W. Reynolds, Computer animation with scripts and actors, Proceedings of the 9th annual conference on Computer graphics and interactive techniques, p.289-296, July 26-30, 1982, Boston, Massachusetts, United States

10 Roth, S., "Ray Casting for Modeling Solids", Computer Graphics and Image Processing, 18, (1), 109-144, January 1982

11 Sawchuk, A. A., "Space-Variant Image Motion Degradations and Restorations", Proc. IEEE, 60, (7), 854-861, July 1972

12 Sawchuk., A. A., "Space-Variant Image Restoration by Coordinate Transformation", JOSA, 64, (2), 138-144, February 1974

13 Shack., R. V., "The Influence of Image Motion and Shutter Operation on the Photographic Transfer Function", Applied Optics, 3, (10), 1171-1181, October 1964

14 Kim L. Shelley , Donald P. Greenberg, Path specification and path coherence, Proceedings of the 9th annual conference on Computer graphics and interactive techniques, p.157-166, July 26-30, 1982, Boston, Massachusetts, United States

15 Turner Whitted, An improved illumination model for shaded display, Communications of the ACM, v.23 n.6, p.343-349, June 1980

#### ↑ CITINGS 8

John Amanatides , Don P. Mitchell, Antialiasing of interlaced video animation, ACM SIGGRAPH Computer Graphics, v.24 n.4, p.77-85, Aug. 1990

Eric B. Lum , Aleksander Stompe , Kwan Liu Ma, Kinetic visualization: a technique for illustrating 3D shape and structure, Proceedings of the conference on Visualization '02, October 27-November 01, 2002, Boston, Massachusetts

W. T. Reeves, Particle Systems—a Technique for Modeling a Class of Fuzzy Objects, ACM Transactions on Graphics (TOG), v.2 n.2, p.91-108, April 1983

Mike Cammarano , Henrik Wann Jensen, Time dependent photon mapping, Proceedings of the 13th workshop on Rendering, June 26-28, 2002, Pisa, Italy

Gabriel J. Brostow , Irfan Essa, Image-based motion blur for stop motion animation, Proceedings of the 28th annual conference on Computer graphics and interactive techniques, p.561-566, August 2001

John Snyder , Jed Lengyel, Visibility sorting and compositing without splitting for image layer decompositions, Proceedings of the 25th annual conference on Computer graphics and interactive techniques, p.219-230, July 1998

T. V. Papathomas , J. A. Schiavone , B. Julesz, Applications of computer graphics to the visualization of meteorological data, ACM SIGGRAPH Computer Graphics, v.22 n.4, p.327-334, Aug. 1988

## ↑ INDEX TERMS

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↳ I.3.3 Picture/Image Generation

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↳ I.4 IMAGE PROCESSING AND COMPUTER VISION

↳ I.4.8 Scene Analysis

↳ **Subjects:** Photometry; Motion

### **General Terms:**

Theory

### **Keywords:**

Camera model, Digital optics, Image restoration, Motion blur, Point-spread function

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 Applications of Computer Vision, 2000, Fifth IEEE Workshop on. , 4-6 Dec. 2000  
 Pages:22 - 28

[Abstract] [PDF Full-Text (736 KB)] **IEEE CNF****3 Synthesis of high dynamic range motion blur free image from multiple captures**

Xinqiao Liu; El Gamal, A.;  
 Circuits and Systems I: Fundamental Theory and Applications, IEEE Transactions [see also Circuits and Systems I: Regular Papers, IEEE Transactions on] , Volume: 50 , Issue: 4 , April 2003  
 Pages:530 - 539

[Abstract] [PDF Full-Text (693 KB)] **IEEE JNL****4 Regularized blur-assisted displacement field estimation**

Tull, D.L.; Katsaggelos, A.K.;  
 Image Processing, 1996. Proceedings., International Conference on , Volume: 3 , 16-19 Sept. 1996  
 Pages:85 - 88 vol.3

---

[Abstract] [PDF Full-Text (468 KB)] IEEE CNF

**5 Cartoon blur: nonphotorealistic motion blur**

*Kawagishi, Y.; Hatsuyama, K.; Kondo, K.;*  
Computer Graphics International, 2003. Proceedings , 9-11 July 2003  
Pages:276 - 281

---

[Abstract] [PDF Full-Text (866 KB)] IEEE CNF

**6 Estimation of motion using motion blur for tracking vision system**

*Kawamura, S.; Kondo, K.; Konishi, Y.; Ishigaki, H.;*  
World Automation Congress, 2002. Proceedings of the 5th Biannual , Volume:  
13 , 9-13 June 2002  
Pages:371 - 376

---

[Abstract] [PDF Full-Text (489 KB)] IEEE CNF

**7 Motion blur identification based on phase change experienced after restorations**

*Jianchao, Y.;*  
Image Processing, 1999. ICIP 99. Proceedings. 1999 International Conference on , Volume: 1 , 1999  
Pages:180 - 184 vol.1

---

[Abstract] [PDF Full-Text (504 KB)] IEEE CNF

**8 Analysis of multiple moving objects in video for removing motion blur**

*Sang Kyu Kang; Jung Hoon Jung; Joon Ki Paik; Young Chan Kim;*  
TENCON 99. Proceedings of the IEEE Region 10 Conference , Volume: 2 , 15-18 Sept. 1999  
Pages:1267 - 1270 vol.2

---

[Abstract] [PDF Full-Text (360 KB)] IEEE CNF

**9 An open and shut case [computer graphics]**

*Glassner, A.;*  
Computer Graphics and Applications, IEEE , Volume: 19 , Issue: 3 , May-June  
Pages:82 - 92

---

[Abstract] [PDF Full-Text (8600 KB)] IEEE JNL

**10 Segmentation-based spatially adaptive motion blur removal and its application to surveillance systems**

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Image Processing, 2001. Proceedings. 2001 International Conference on , Vol 1 , 7-10 Oct. 2001  
Pages:245 - 248 vol.1

---

[Abstract] [PDF Full-Text (416 KB)] IEEE CNF

**11 An iterative frequency-domain technique to reduce image degradation**

**caused by lens defocus and linear motion blur***Bhaskar, R.; Hite, J.; Pitts, D.E.;*

Geoscience and Remote Sensing Symposium, 1994. IGARSS '94. 'Surface and Atmospheric Remote Sensing: Technologies, Data Analysis and Interpretation International , Volume: 4 , 8-12 Aug. 1994

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Automatic Control, IEEE Transactions on , Volume: 22 , Issue: 3 , Jun 1977

Pages:294 - 302

[\[Abstract\]](#) [\[PDF Full-Text \(1216 KB\)\]](#) [IEEE JNL](#)**13 Jitter camera: high resolution video from a low resolution detector***Ben-Ezra, M.; Zomet, A.; Nayar, S.K.;*

Computer Vision and Pattern Recognition, 2004. CVPR 2004. Proceedings of the 2004 IEEE Computer Society Conference on , Volume: 2 , 27 June-2 July 2004

Pages:II-135 - II-142 Vol.2

[\[Abstract\]](#) [\[PDF Full-Text \(793 KB\)\]](#) [IEEE CNF](#)**14 Simultaneous image formation and motion blur restoration via multi capture***Xinqiao Liu; El Gamal, A.;*

Acoustics, Speech, and Signal Processing, 2001. Proceedings. (ICASSP '01). 2001 IEEE International Conference on , Volume: 3 , 7-11 May 2001

Pages:1841 - 1844 vol.3

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Pattern Recognition, 1992. Vol.III. Conference C: Image, Speech and Signal Analysis, Proceedings., 11th IAPR International Conference on , 30 Aug.-3 Sep. 1992

Pages:561 - 564

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Xuezhang Liu; Mingjing Li; Hongjiang Zhang; Dingxing Wang;  
 Image Processing, 2003. Proceedings. 2003 International Conference on , Vol 2 , 14-17 Sept. 2003  
 Pages:II - 957-60 vol.3

[Abstract] [PDF Full-Text (362 KB)] **IEEE CNF****2 Restoration of multiple images with motion blur in different directions**

Rav-Acha, A.; Peleg, S.;  
 Applications of Computer Vision, 2000, Fifth IEEE Workshop on. , 4-6 Dec. 2000  
 Pages:22 - 28

[Abstract] [PDF Full-Text (736 KB)] **IEEE CNF****3 Synthesis of high dynamic range motion blur free image from multiple captures**

Xinqiao Liu; El Gamal, A.;  
 Circuits and Systems I: Fundamental Theory and Applications, IEEE Transactions [see also Circuits and Systems I: Regular Papers, IEEE Transactions on] , Volume: 50 , Issue: 4 , April 2003  
 Pages:530 - 539

[Abstract] [PDF Full-Text (693 KB)] **IEEE JNL****4 Regularized blur-assisted displacement field estimation**

Tull, D.L.; Katsaggelos, A.K.;  
 Image Processing, 1996. Proceedings., International Conference on , Volume: 3 , 16-19 Sept. 1996  
 Pages:85 - 88 vol.3

---

[Abstract] [PDF Full-Text (468 KB)] IEEE CNF

**5 Cartoon blur: nonphotorealistic motion blur**

*Kawagishi, Y.; Hatsuyama, K.; Kondo, K.;*  
Computer Graphics International, 2003. Proceedings , 9-11 July 2003  
Pages:276 - 281

---

[Abstract] [PDF Full-Text (866 KB)] IEEE CNF

**6 Estimation of motion using motion blur for tracking vision system**

*Kawamura, S.; Kondo, K.; Konishi, Y.; Ishigaki, H.;*  
World Automation Congress, 2002. Proceedings of the 5th Biannual , Volume:  
13 , 9-13 June 2002  
Pages:371 - 376

---

[Abstract] [PDF Full-Text (489 KB)] IEEE CNF

**7 Motion blur identification based on phase change experienced after restorations**

*Jianchao, Y.;*  
Image Processing, 1999. ICIP 99. Proceedings. 1999 International Conference on , Volume: 1 , 1999  
Pages:180 - 184 vol.1

---

[Abstract] [PDF Full-Text (504 KB)] IEEE CNF

**8 Analysis of multiple moving objects in video for removing motion blur**

*Sang Kyu Kang; Jung Hoon Jung; Joon Ki Paik; Young Chan Kim;*  
TENCON 99. Proceedings of the IEEE Region 10 Conference , Volume: 2 , 15-18 Sept. 1999  
Pages:1267 - 1270 vol.2

---

[Abstract] [PDF Full-Text (360 KB)] IEEE CNF

**9 An open and shut case [computer graphics]**

*Glassner, A.;*  
Computer Graphics and Applications, IEEE , Volume: 19 , Issue: 3 , May-June  
Pages:82 - 92

---

[Abstract] [PDF Full-Text (8600 KB)] IEEE JNL

**10 Segmentation-based spatially adaptive motion blur removal and its application to surveillance systems**

*Sang Kyu Kang; Ji Hong Min; Joon Ki Paik;*  
Image Processing, 2001. Proceedings. 2001 International Conference on , Vol 1 , 7-10 Oct. 2001  
Pages:245 - 248 vol.1

---

[Abstract] [PDF Full-Text (416 KB)] IEEE CNF

**11 An iterative frequency-domain technique to reduce image degradation**

**caused by lens defocus and linear motion blur***Bhaskar, R.; Hite, J.; Pitts, D.E.;*

Geoscience and Remote Sensing Symposium, 1994. IGARSS '94. 'Surface and Atmospheric Remote Sensing: Technologies, Data Analysis and Interpretation' International , Volume: 4 , 8-12 Aug. 1994

Pages:2522 - 2524 vol.4

[\[Abstract\]](#) [\[PDF Full-Text \(276 KB\)\]](#) [IEEE CNF](#)**12 Digital restoration of images degraded by general motion blurs***Aboutalib, A.; Murphy, M.; Silverman, L.;*

Automatic Control, IEEE Transactions on , Volume: 22 , Issue: 3 , Jun 1977

Pages:294 - 302

[\[Abstract\]](#) [\[PDF Full-Text \(1216 KB\)\]](#) [IEEE JNL](#)**13 Jitter camera: high resolution video from a low resolution detector***Ben-Ezra, M.; Zomet, A.; Nayar, S.K.;*

Computer Vision and Pattern Recognition, 2004. CVPR 2004. Proceedings of the

2004 IEEE Computer Society Conference on , Volume: 2 , 27 June-2 July 2004

Pages:II-135 - II-142 Vol.2

[\[Abstract\]](#) [\[PDF Full-Text \(793 KB\)\]](#) [IEEE CNF](#)**14 Simultaneous image formation and motion blur restoration via multi-capture***Xinqiao Liu; El Gamal, A.;*

Acoustics, Speech, and Signal Processing, 2001. Proceedings. (ICASSP '01). 2

IEEE International Conference on , Volume: 3 , 7-11 May 2001

Pages:1841 - 1844 vol.3

[\[Abstract\]](#) [\[PDF Full-Text \(388 KB\)\]](#) [IEEE CNF](#)**15 Compensation of motion blur in binary images***Michaelis, B.; Heimburger, T.;*

Pattern Recognition, 1992. Vol.III. Conference C: Image, Speech and Signal Analysis, Proceedings., 11th IAPR International Conference on , 30 Aug.-3 Sep. 1992

Pages:561 - 564

[\[Abstract\]](#) [\[PDF Full-Text \(268 KB\)\]](#) [IEEE CNF](#)[1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [Next](#)

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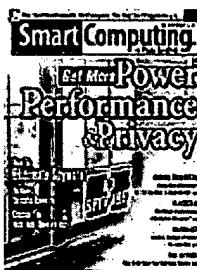
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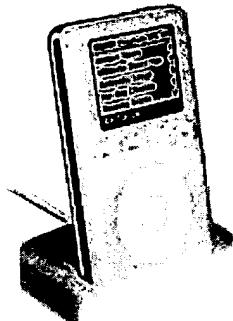
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### motion blur

Motion blur is a graphics filter used in programs such as Adobe Photoshop, Jasc Paint Shop Pro, and Corel PHOTO-PAINT to create the illusion of movement or motion. Motion blur filters smooth image transitions by averaging the pixels beside the hard edges of defined lines and shaded areas where considerable color transitions occur. The motion can be controlled by angle or direction (0 to 360 degrees or -90 to +90) and/or by distance or intensity in pixels (0 to 999), based on the software. Some programs also offer the option to ignore pixels outside the primary image, use the paper or background color as well, or sample the nearest edge pixel. These are useful options if you want to motion blur the background and the image (similar to a photo shot from a moving car) or just motion blur an object inside the image (such as a spinning top on a still background).

In animation programs, motion blur is actual movement, not the illusion. Animators can select the effect length or time and the number of frames per second (fps) for the effect to occur. For example, 10 seconds of animation at 16fps to view a spinning top or a bouncing ball. The blur angle can be from -180 to +180 degrees and the blur radius can be adjusted from 0 to 100, again based on the software. More expensive programs offer greater radius options plus additional features, such as animating the entire frame or selected objects inside the frame plus background color and fill selections.

In addition to motion blur, graphic programs also offer **Gaussian blur** (which blends a specific number of pixels incrementally following a bell-shaped curve where the blurring is dense in the center and feathers at the edges), **smart blur** (blurs rough edges inside an object), **radial blur** (blurs in a radius of concentric circles), **smooth** (similar to a soft camera lens), **directional smooth** (a soft camera lens with the blurring in one direction), **soften** (same as smooth), **soften more** (smooth again a little more), **jaggy despeckle** (smoothes the jagged edges of a low resolution image), and several others based on the program.

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- The National People's Congress of the People's Republic of China ratifies an anti-secession law authorizing the use of violence if a Taiwanese declaration of independence is made.
- The 24-day Salt March To Dandi, a historic act of non-violent protest led by Mahatma Gandhi in colonial India, is re-enacted on its 75th anniversary.
- The State Council of the People's Republic of China approves the resignation of Hong Kong's Chief Executive Tung Chee Hwa, who then becomes a vice-chairman of the Political Consultative Conference.



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# Motion blur

From Wikipedia, the free encyclopedia.

**Motion blur** is the apparent streaking of rapidly moving objects in a still image or a sequence of images such as a movie or animation.

When an image of moving objects or from a moving camera is created it does not always merely represent a single instant of time. Often because of technological constraints or artistic requirements the image must represent the scene over a period of time. As objects move in a scene over time an image of that scene must represent an integration of all positions of a camera's viewpoint and object positions over the period of exposure determined by the shutter speed. Any moving object with respect to the camera in such an image will look blurred or smeared along the direction of relative motion, this smearing may occur on an object that is moving or on a static background if the camera is moving. In a film or television image this looks natural because the human eye behaves in much the same way.

Because the effect is caused by the relative motion of the camera, object and scene being imaged, the camera may be used to track moving objects by panning the camera such that even with long exposure times motion blur is avoided on the moving object but instead appears on the background.

In televised sports, where conventional cameras expose pictures 25 or 30 times per second, motion blur can be inconvenient because it obscures the exact position of a projectile or athlete in slow motion. For this reason special cameras are often used which eliminate motion blurring by taking rapid exposures on the order of 1/1000 of a second, and then transmitting them over the course of the next 1/25 or 1/30 of a second. Although this gives sharper slow motion replays it can look strange at normal speed because the eye expects to see motion blurring and does not.

Similarly, in real-time computer animation each frame shows a perfect instance in time (analogous to a camera with an infinitely fast shutter), with zero motion blur. This is why a video game with a frame rate of 25-30 frames per second will seem 'jumpy' and strange, while natural motion filmed at the same frame rate appears continuous. To compensate for this, much higher frame rates are desirable, of 60 fps or more. In pre-rendered computer animation, such as CGI movies, simply raising the frame rate is not possible, but realistic motion blur can be drawn because the renderer has much longer to draw each frame. Temporal anti-aliasing produces frames as a composite of many instants.

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